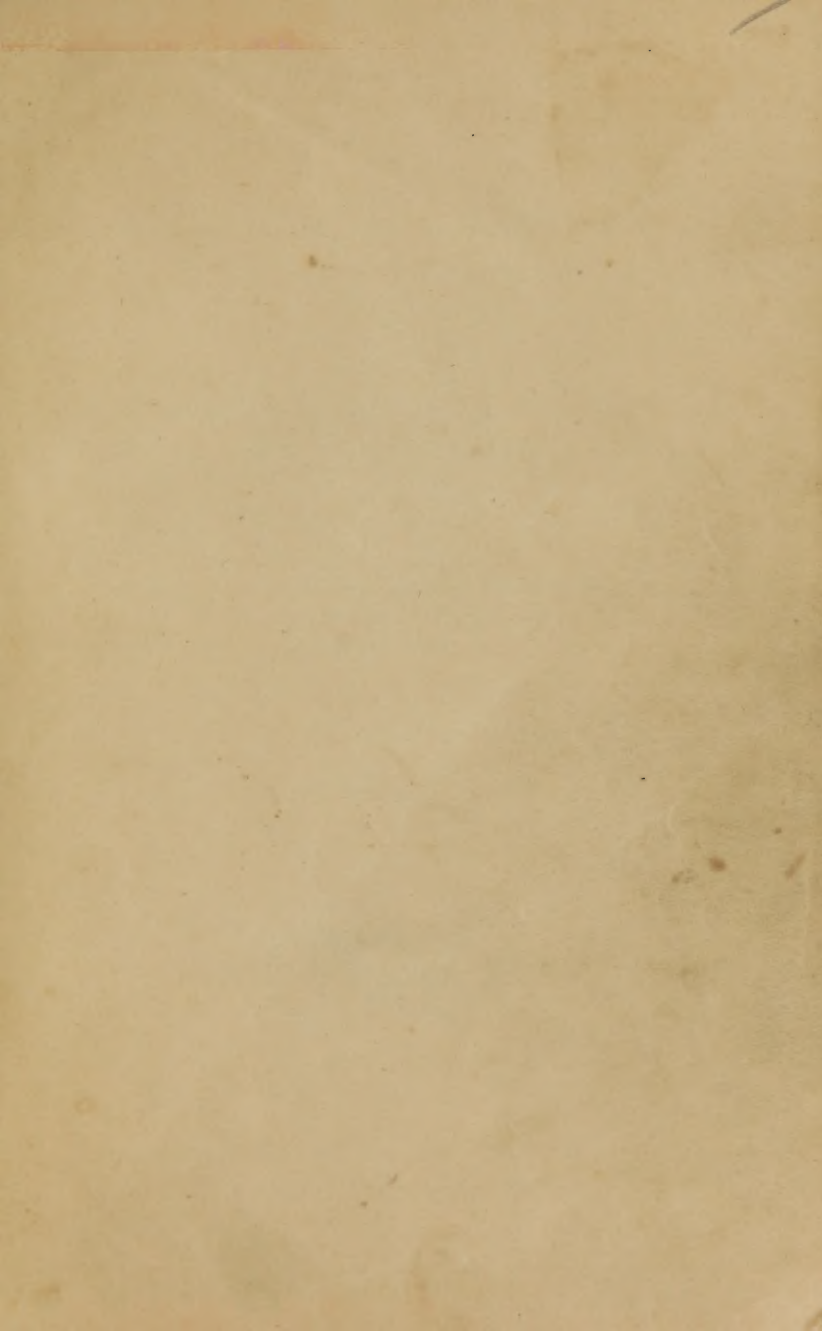
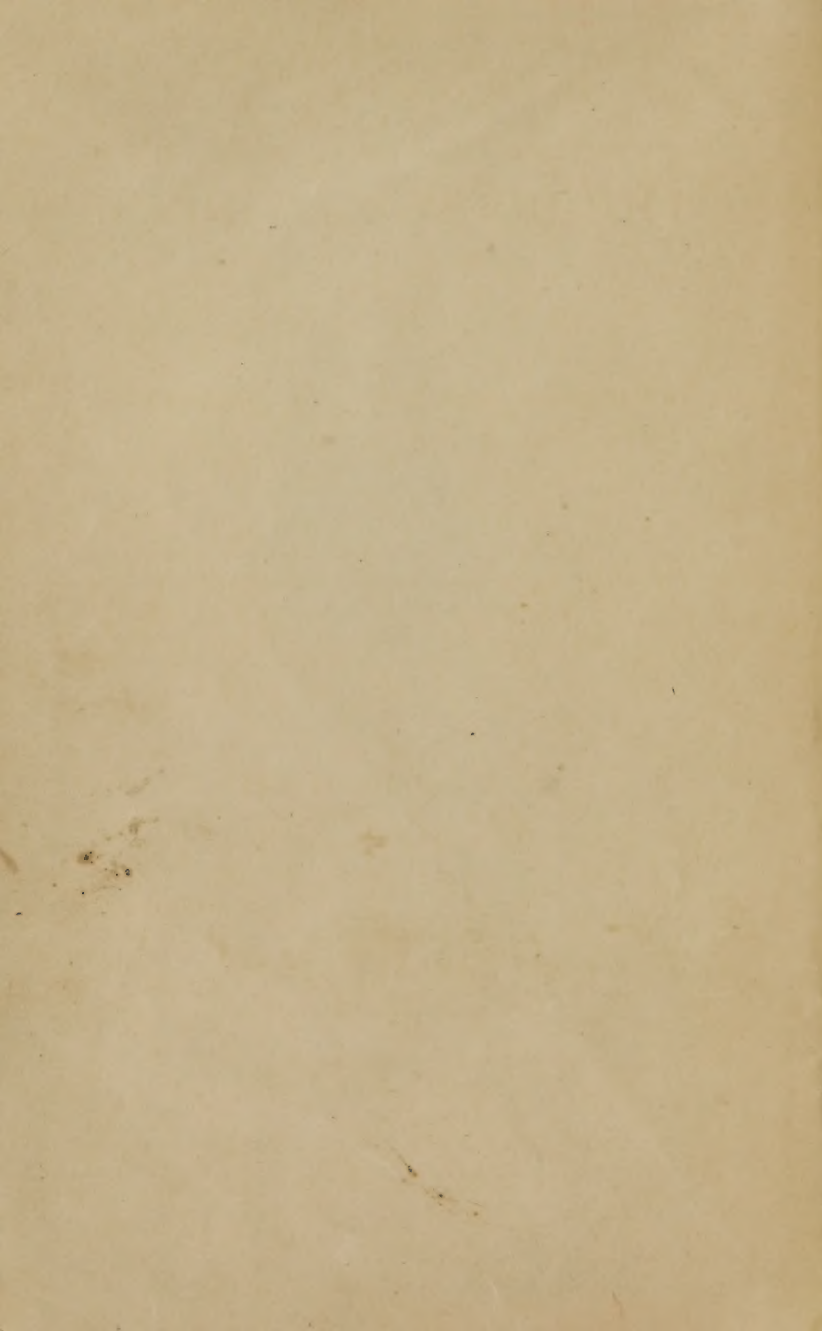


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ECLECTIC EDUCATIONAL SERIES

THE HOUSE I LIVE IN

OR

AN ELEMENTARY PHYSIOLOGY FOR CHILDREN IN
THE PUBLIC SCHOOLS

*With Special Reference to the Nature of Alcoholic Drinks and
Narcotics, and their Effects upon the
Human System*

BY

ELI F. BROWN, M. D.



VAN ANTWERP, BRAGG & CO.

CINCINNATI AND NEW YORK

Department of Scientific Instruction of National Woman's Christian
Temperance Union.

BOSTON, December 17, 1888.

THE ECLECTIC SERIES OF TEMPERANCE PHYSIOLOGIES has been prepared with special reference to the nature of Alcoholic Drinks and other narcotics, and their effects upon the human system; and in accordance with the requirements of the Department of Scientific Instruction, of the National Woman's Christian Temperance Union.

We, the undersigned, therefore indorse and commend this series of books, as follows:

THE HOUSE I LIVE IN, (Revised Edition), for Primary Schools.

THE YOUTH'S TEMPERANCE MANUAL, for Intermediate Schools.

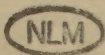
THE ECLECTIC PHYSIOLOGY, OR GUIDE TO HEALTH, for High Schools, and Advanced Classes in Common Schools.

Mary H. Hunt,

Superintendent.

ALBERT H. PLUMB,
DANIEL DORCHESTER,
JOSEPH COOK,
WILLIAM E. SHELDON.

} *Advisory Board.*



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The Eclectic Press

PREFACE



IN these lessons for small children, simple words are used, and only such facts about the structure of the body and the functions of its organs presented, as are necessary for the proper understanding of the effects of alcoholic drinks and other narcotics, and the general laws of health.

Little children need to learn the plainest lessons of ordinary life, such as those of temperance, cleanliness, neatness, how to exercise, what to avoid as harmful, and similar lessons regarding the promotion of their bodily growth and the preservation of their health.

To be effective, the instruction must be interesting. Each child should feel that he is learning about his own body and how to take care of it.

Some of the lessons are given in the form of stories, which the pupil may reproduce in oral or in written form. In some cases anatomical charts and pictures will serve best as auxiliary illustrations; in others, easily-obtained material from slaughtered animals will arouse that active interest which children feel in objective illustrations. Blackboard diagrams and simple experiments are also desirable helps in some of the lessons.

The injurious effects of alcoholic drinks and tobacco are set forth freely in the text, that children may early learn of the evil consequences, and thus be forewarned against the use of alcoholic drinks and other narcotics. The teacher should not fail to make the instruction regarding these substances especially forcible.

Thanks are due to Mrs. Mary H. Hunt, of the National Woman's Christian Temperance Union, for her careful revision of the book, which resulted in a re-arrangement of the earlier chapters and the insertion of the chapter on Alcohol and Alcoholic Drinks.

ELI F. BROWN.

Dec., 1888.

THE HOUSE
I LIVE IN.



IN the morning, when we are lying perfectly quiet in our beds, we can think of the pleasant sunshine, the fragrant open air, the leaves of shining green, and the birds singing among the branches. We can think how these things look while our bodies are still in bed; but if we want to see the open sky and feel the fresh air, and hear the singing of birds and all the sounds of animate nature, we must move. How do we move? Who makes our feet act? Who controls our hands? We think of it: we resolve to do, and it is done.

There is something, then, within our bodies that is really *I*, myself, and the body is the House in which this *I* lives. Each body has its own living soul within, that may differ as much from every other one as our bodies differ.

At night we lose ourselves in sleep; in the morning we find ourselves in the same House with the same hands and feet and features,—with the same knowledge and the same ignorance that we had when we lay down. But even while we are asleep, the body grows in vigor and strength without thought or care from us.

Surely, this is a wonderful House in which we live. We must care for it and preserve it from injury; and in order that we may be able to do so, we must learn how to take care of it. A man who is to take care of a steam-engine, or any fine piece of machinery, spends years in learning his trade. We have a body given us that is more delicate than any machine that man ever made. At first our parents and friends care for us. We are watched and fed and kept neat and clean. Our bodies grow larger and stronger, and our minds are stronger too.

We must learn, then, how to care for our own health. The object of this book is to teach you how to grow up into healthful, shapely, and strong men and women.

THE HOUSE I LIVE IN.



WHAT WILL YOU CHOOSE?

ROBERT MASON had been ill with fever for many weeks, but was almost ready to be out-of-doors.

Two classmates, Harry Wilson and Frank Burt, had called to learn when Robert would be with them again in school.

Robert's father was fond of boys, and when he had finished reading his evening paper, the boys asked him to tell them a story.

"I shall not tell you a story this time," said Mr. Mason, "for I wish you to do some thinking, and to answer a question for me."

"Suppose I could give each of you one thing of great value, what would you choose?"

Each boy's face lighted up quickly, as thoughts of the many desirable things began to pass before his mind.

"I know what I want," said Harry Wilson, "I choose money. I wish to be very rich. Then I can have a nice horse and fine clothes. I can buy a home for my mother, and I can travel every-where."

Frank Burt was next to speak. "I will choose knowledge," said he. "Then I shall know every thing about machines and birds and people. I can read good books and know all about every thing."

Robert, with his pale face, was slower to answer. When the others had finished, he said: "Father, I know what I choose. I wish to be well and strong all the time. Then I can finish my education so that I shall have great knowledge. I can follow some useful business and become rich if I wish to do so."

"You have all answered well," said Mr.

Mason, "but I like Robert's answer best. If to good health you add goodness of heart, life will bring you much enjoyment, and you can be of great use to others. Without health you can do nothing."

Harry and Frank agreed that Robert had chosen best.

OUR BODY.

Our body is the curious house in which we live. We may see it, feel it, weigh it, move it, notice what it does, and in many ways learn how it is made.

This body is our own. We must take proper care of it that it may be well. We must use it rightly to make it strong. We should keep it neat and clean. If we injure it, we shall suffer pain. If we destroy it, we shall die.

Men have often taken bodies like ours to pieces, and have separated all the curious parts from one another.

Every portion is intended for use, and all the parts work together with perfect smoothness. It is more wonderful than a watch or an engine, for the body is a living thing in which our mind or soul dwells.¹*

* These numbers throughout the text refer to the Notes at the close of the volume.

We should wish to be well, for then only can we go about our work or play with a light heart. We may spend our time in the open air and in the pleasant sunlight. When we are well, we can do our own work and also be of service to others. Good health will cheer us every hour, and will lighten every load for us.

We should wish to avoid sickness. Often when we are ill, we are helpless. Our friends must wait upon us. We may not be able to lift our head from the pillow, and we must lie restless in bed for days and weeks. Sickness makes the stoutest heart grow faint, the strongest arm become weak, and the fairest day seem cloudy.

We need to learn the lessons of good health while we are young, and, by heeding them, we may hope to become strong and healthy men and women.

CHAPTER I.

FOOD AND DRINK.

THINGS that are good for us to eat are food. The food that we take into the mouth is sent by the blood to all parts of the body, and in this way builds us up and keeps us strong and healthy.

If we had no food, we would suffer greatly for many days, and finally we should die of hunger.

We must also have water to drink, for it helps to form every part of the body. We can live much longer without food than without water.

Some men were digging in a mine. Suddenly they were shut in by the falling of the earth at the opening. The poor men had no food or water. It took seven days for their friends on the outside to dig away the fallen earth and stones.

At last an entrance was made, and the miners were found; but they had died from want of food and drink.



STORY OF A BITE OF BREAD.

One Friday afternoon, in a village school, when the lessons were over, the desks were put in order, and the little pupils were ready for a story.

They were much surprised to see the teacher take something from her satchel and unwrap

the napkin that was about it. She held it up that all might see it.

"This is an extra slice of bread," said she, "that I have brought with my lunch. This slice is for you, and before I tell you the story, each of you must take a bite."

The bread was broken into pieces and a small bite was placed on the desk in front of each pupil, while one piece remained in the teacher's hand.

"You must now eat your bite, and be sure to chew it well," said the teacher.

Each child did as she directed, and all were much amused at such an odd way of beginning a story. "I wish you to hear the story of a bite of bread, so I shall be tongue for it and tell you what the bread might say if it could tell its own story."

"I am a bite of bread," she said, holding up the piece in her hand. "The grains of wheat from which I was made grew on a farm near the village. After the harvest, the farmer took the wheat to the village mill, and the miller ground the grains to flour from which your teacher's mother made the nice bread you have just eaten.

"While I am only a bite of bread, little children, I wish you to learn that I contain the best kind of food that you can eat, and that I

can do much toward helping you to grow, and making you strong.

“I shall be entirely changed after I enter your body, for presently I shall cease to be bread, and become a part of yourself.

“Put me in your mouth and chew me well. This will make me soft and moist. You will find that I am pleasing to your taste.

“From your mouth I am swallowed. I slip easily down your throat, and lodge in a fleshy bag or pocket that lies across the middle of the inside of your body. This bag is your stomach. The stomach rolls me about for an hour or two, and mixes me with the curious juices that it pours upon me.

In this way I am so greatly changed that you would not know me, for I have become a gray paste somewhat like thick milk. I have been torn to pieces so that the parts that are suited to build your body are ready to be separated from the other portions.

“Your stomach has been very busy at its work of changing me. The blood has been flowing to it to aid in the work. Now that my good part is ready to leave the stomach, the blood-tubes suck this portion into themselves. The part that is not suited for the blood passes into the intestines that join with the stomach.

“My good portion is now in the blood; it mixes with the blood, and, after passing through some curious places that you call your liver and lungs, this rich part becomes blood itself.

“I am now your own rich blood, and am hurrying on my way to warm and to feed your body. As I pass by the various parts, the bones will pick out such materials as they need, the muscles will take what they want, and the brain and the skin what they require. In this way each hungry part gets what it needs from me.”

“So, little children,” said the teacher, “the bite of bread that you have chewed and swallowed is now being changed in your stomach. After a while the good part of it will be taken into your blood, and will be carried through your body to feed the hungry parts. All the food you eat is changed in this manner by the stomach and intestines. The good part makes blood, and the other portions are thrown out of the body.”

GOOD KINDS OF FOOD AND DRINK.

The healthy stomach is glad to get good food with which to make blood, but bad food often gives the stomach pain and causes sickness.

We may safely eat all we desire of plain bread, well cooked, lean meat, eggs, potatoes, rice, and ripe fruits, because it is their nature to make good blood and strong flesh for us.

Water and milk are the best of drinks. It is not well to drink tea and coffee, for these substances do not make good blood. They are especially bad for children, and all persons are better without them.

We must eat very little of rich pies, ice-cream, cakes, and candy. These may please us with their taste, but we should not eat things simply because we like their taste. The stomach can not taste, and it may find that these "sweetmeats" are very poor food for making blood.

A girl's mother brought home many rich things from a picnic. The little girl was greatly pleased the next day to eat these preserves, candies, and cakes. Alas! for the little girl; she grew very sick and for many weeks her mother feared that she would die. The doctor said that the girl had made herself sick by eating so many "sweetmeats." When she got well she was more careful.

A boy named Tom had a large fruit-cake given to him by his grandmother for a birthday present. His mother let him eat some of it during the day, but Tom was not sat-

isfied ; so when night came he slipped off to bed and put a large piece of cake under his pillow. He lay awake a long time eating the nice bites, and thinking what a kind grandmother he had. Before morning, however, the poor boy was screaming with pain. He was very sick.

The doctor came, and, finding the cake-crumbs in Tom's bed, knew at once the cause of the trouble. Tom had to take some ugly medicine, and he was sick for more than a week. The remainder of his cake lasted him for a long time, as he had learned not to eat too much of it at once.

HOW TO EAT AND DRINK.

We should eat slowly, and chew the food well with the lips closed. This will prepare the food for the stomach.

If we moisten the food by chewing it, we shall not need to drink as we eat.

Too much water or other drink taken while eating weakens the juices of the stomach so that the food is not easily changed.

Ice-water or other very cold drink chills the stomach and stops it from changing the food. We should drink sparingly of ice-water at any time.

Very hot food or drink burns the stomach.

It is not proper for us to put into the stomach any thing that is too hot or too cold to be held in the hand with comfort.

We should not eat too often. The stomach needs rest between the seasons of its work. "Eating between meals" robs the stomach of its rest.

We should rest a short time, at least, both before and after eating. To eat while we are very tired or warm may make us sick.

To eat late at night may prevent us from sleeping soundly.

We need to eat good food and to stop eating before we have eaten too much. We are more likely to eat too much than too little.

TOBACCO.

Tobacco is not food. It will not make good blood. It contains a poison, which, like every other poison, tends to kill if we take it into the body.²

By using a small quantity of tobacco at first, men are able to bear the harm it does though it may make them very sick. After using it for some time they are less able to feel its injurious effects, and finally they form the strongest of appetites for it.

When tobacco is chewed, some of its poison goes directly into the blood through the skin

of the mouth, and some of it is swallowed into the stomach.

In smoking tobacco the poison enters the blood about as it does in chewing, while the strong smoke injures the lungs and makes the air impure.

Cigarettes are even worse than cigars. They are often made of the poorest tobacco, to which other poisons are added to give strength or flavor.

Some men do not realize the harm tobacco is doing them, so long as they feel strong and well, while it is plain that others are made weak and nervous from its effects. So powerful a poison as tobacco must in the end injure those who use it. You will learn in another chapter how it makes the users selfish, and careless of others, because of its deadening effect upon the nerves. No one can afford to use it in any way. It will cost him his money, and, what is worse, his health, and will fix upon him an evil habit that may cling to him for life.³

ALCOHOLIC DRINKS.

Some drinks are harmful because they tend to make those who use them sick, and lead them to do wrong.

The most common of these are cider, beer,

wine, brandy, gin, and whisky. All of these contain a poison known as alcohol, and, for this reason, they are called alcoholic drinks.

If we take some of the alcohol out of them we shall find that it has a mild odor and a burning taste. It is clear like water but will burn like oil.⁴

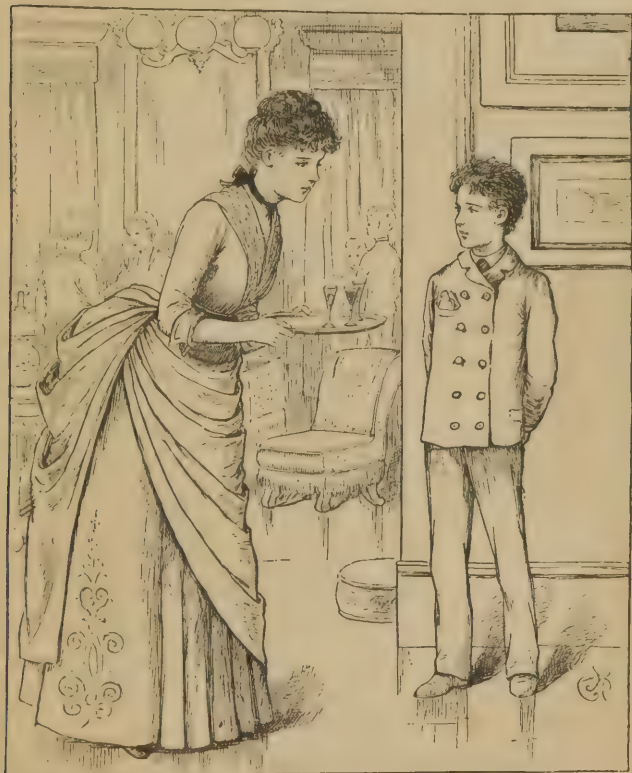
The important thing for us to remember is, that alcohol is a poison, and not a food. It is not found in any food as nature gives us that food. It does not grow in apples, grapes, grain, or in any fruit or vegetable. The stomach can not digest it.

The inside of a healthy stomach is pale pink in color. If a glass of wine or beer is drank, it will turn to a little deeper shade; if more beer or wine is taken, the color will change to a darker red. The alcohol has caused too much blood to rush into the blood-vessels of the stomach. We say it is inflamed. It can not do its work so well with alcohol as without it.

Food must be dissolved in the stomach before it can be carried by the blood to make bone, muscle, and other parts of our bodies. Alcohol in the stomach tends to harden food so that it will not easily dissolve. Any alcoholic liquor, as wine, beer, brandy, or cider, hurts the stomach and hinders digestion.

WILLIE FOX AND THE GLASS OF WINE.

Willie Fox was a large boy, the pride of his widowed mother. He had been invited to a



birthday party at the house of a school-mate. It was his first evening from home without the care of his mother.

As the evening grew late, wine was served to all the young people. Willie remembered the repeated caution of his mother against drinking wine, and at first did not take any.

But the lady of the house urged him to drink one glass, for it was wine that she had made from her own grapes. Willie consented, and took his first glass of wine. As the taste was pleasant and he felt no bad effect from the first glass, he afterwards took a second, and then a third.

He grew sick. His head reeled, and his feet became unsteady. When it was time to go home, Willie was taken to his mother in a sad plight.

He suffered greatly from headache caused by the alcohol in the wine, and, what was more painful, his heart burned with shame because he had taken wine until he was drunk, and because he had thus caused his mother grief.

The memory of his heart-ache and headache kept him from drinking wine again. You should not drink wine, because there is alcohol in it.

THE POISON APPETITE.

Strange as it seems, we can form an appetite for some kinds of poison. By using a little at first, we may not seem to be much hurt. But

if we keep on, an appetite will grow so that we must have more and more of the poison.

This is true of tobacco and alcoholic drinks. The same is true of opium, chloral, cocaine, arsenic, and other poisons which people sometimes use.

Opium is a substance that is much used in medicine to soothe pain and to produce sleep. This makes it dangerous, for, if persons form an appetite for it and use it regularly, they become diseased in body and dull in mind.

Opium tends to kill the nerves and the brain. The habit of using opium makes a person very wretched, and is apt to drive him at last to a horrible death.

Chloral is a medicine that causes nearly the same effects that opium does. Persons may sometimes acquire an appetite for it by using it to produce sleep.

We need to beware of all such things, for, if they take firm hold of us, our appetite for them will slowly but surely increase, and will finally cause the ruin of both the body and the mind.

If a person who is trying to overcome an alcoholic appetite should taste a little liquor, it might rouse again a strong desire for more. This awakened appetite is often so strong that the drinker can not or does not resist it.

No alcoholic liquor as brandy, wine, cider, etc., should ever be used to flavor food. They are poisons, and may create an appetite, or awaken a slumbering one that will be very hard to control.

THINGS TO BE REMEMBERED.

We eat to live, for the food makes the blood that gives life and strength to the body.

Proper growth and health require us to be very careful about our eating.

We must use good food and pure drink.

We must eat only the proper quantity in a correct manner and at the right time.

We must eat sparingly of spices, candies, and other rich dainties.

We must not use tobacco or alcoholic drink.

We must beware of forming a taste or appetite for any kind of poison.

We must remember that alcohol is a poison and not a food, and that it hurts the stomach and hinders digestion.

We must not eat such things as jellies, sauces, or any food flavored with wine, brandy, or any liquor containing alcohol.

QUESTIONS AND ANSWERS.

What is food? Any thing that is healthful to eat.

What will good food do? It will form blood.

What kinds of food are good? Bread, lean meat, potatoes, rice, ripe fruits, and other simple substances.

What drinks are the best? Pure water and milk.

How do we know when we need food and drink? By hunger and thirst.

How is the food changed? By juices in the mouth, the stomach, and the intestines.

How should we chew the food? Slowly and well, without drinking as we eat.

Why should we not use strong tea and coffee? These drinks do not make good blood. They make us nervous.

Why should we not eat much of spices and candies? These may please our taste, but the stomach finds them to be bad food.

Why should we not drink much ice-water? It chills the stomach.

What else will chill the stomach? Ice-cream, or any other very cold food or drink.

Why should we not eat very hot food? It will burn the stomach.

How else may we injure the stomach? By eating too often or too much.

Is tobacco a food? It is not. It does nothing but harm to the body.

Why do men use tobacco? To get the poison from it which they have learned to like.

How does tobacco injure the body? By making the muscles weak, and the brain and nerves dull.

Why should young people especially not use tobacco? Tobacco injures the blood and tends to stop the growth of the body.

What are alcoholic drinks? Drinks which have alcohol in them.

Where is alcohol not found? It is not found in any food, as nature gives that food to us.

If fruits, grains, and vegetables are foods, why is not the alcohol, which is made from them, food also? Fermentation has changed it into a poison.

What color is the inside of a healthy stomach? Pale pink.

How will a glass of beer or wine affect this color? It will turn it to a deeper shade, and more of any alcoholic liquor will change it to a darker red.

What do we then say of the stomach? That it is inflamed. The stomach can do its work better without alcohol than with it.

What is first done in the stomach to food? It is first dissolved by the juices of the stomach so that the blood can carry it to make other parts of our bodies.

What is the effect of alcohol in the stomach? Alcohol tends to harden the food so that it will not easily dissolve.

How does alcohol affect digestion? Any alcoholic liquor, as wine, beer, cider, or brandy, hurts the stomach and hinders digestion.

What common drinks have alcohol in them? Cider, wine, beer, brandy, and whisky.

What is the important thing for us to learn about alcohol? Alcohol is a poison and not a food.

CHAPTER II.

ALCOHOL AND ALCOHOLIC DRINKS.

ALCOHOL is made from sugar. Sugar is a food. Alcohol is a poison. You could not live without food. If you should take too much of any food it might injure you, but that would be your fault and not that of the food. It is the nature of food to support life, to build up our bodies and make them strong and well.

It is the nature of a poison to injure health and to destroy life. A little poison will harm us; more will kill us. No poison has injured and destroyed so many people as alcohol.

While a proper amount of food is necessary for life, there is no proper amount of alcohol to drink; any at all is too much. A little of it will injure, more will kill, because it is its nature to do that.

ALCOHOLIC APPETITE.

Perhaps you are fond of milk. It is a safe drink to like, for it is the nature of milk to make you strong and well. One glass of milk

will satisfy your thirst ; it will not make you want to keep drinking glass after glass of milk until you seem to care for nothing but to drink milk. Alcohol is not like milk in this respect. It is the nature of any liquor that has alcohol in it, to make the drinker want more and more until he cares for nothing so much as to get an alcoholic drink.

Many persons who at first take only a little beer, cider, or wine, form a great desire for them, and often the appetite for these milder drinks leads them to use brandy and whisky. The appetite for alcoholic liquors usually grows rapidly, and men who use but little at first often become drunkards in a short time.

FERMENTATION.

How can such a poison as alcohol be made from a food like sugar? Dry sugar will not make alcohol, neither will liquids that have too much sugar.

Dissolve sugar in just enough water, add a little yeast, and let the mixture stand in a warm place.

In a short time bubbles are seen in the liquid thus prepared ; these are the bubbles of gas, and they show that the sugar is "breaking up" into gas and the liquid alcohol. Much of this gas goes off into the air, but the

alcohol remains in the liquid, making it a dangerous drink.

The process by which sugar is turned into alcohol is a form of fermentation.

There are many different kinds of fermentation. You will learn in these lessons of only two of these.

(1). Vinous Fermentation, the change of sugar, a food, into alcohol, a poison.

(2). Acetic Fermentation, the change of alcohol, a poison, into vinegar, an acid sometimes used with food.

You will notice and should remember, that fermentation changes the nature of any substance it works upon. Through its action men turn fruit and grain juices that were good foods into poisonous drinks.

CIDER.

Cider is made from the juice of apples. If we mash the apples and squeeze out their juice, we shall have sweet cider. It is sweet because of the sugar that is in it. It will stay sweet only about six hours if it is left, as it usually is, open to a moderately warm air. The sugar in the apple juice will change to a gas that will bubble out of it into the air, and to alcohol that will remain in it.

In the place of sweet cider containing sugar,

we now have hard cider containing a little alcohol. It will grow harder as this change goes on until all the sugar in the juice has turned to alcohol. In such cider one part in ten is often alcohol,—enough to make a cider drunkard of the person who drinks it.

You remember it is the nature of the little alcohol that is formed when the cider first begins to change, to create an appetite for more and more alcohol. Cider has ruined many boys and men by thus giving them such a liking for alcohol, that they wanted drinks that are stronger even than hard cider.

Besides injuring the health, alcohol spoils the character of those who take it. It makes them cruel, selfish, hard, and untruthful.

Cider especially makes its drinkers cross and ugly tempered.

WINE.

If the juice of grapes or berries is pressed out and left open to a moderately warm air, the sugar in such juices will ferment; that is, it will turn to gas and alcohol. Such a liquid is called wine. Sweet grapes and apples make the strongest wine and cider because there is more sugar in their juices to turn to a poisonous fluid. Wine is about one part in five alcohol and sometimes more.

Men do not put yeast into apple or grape juices to turn them into cider or wine. A ferment floating in the air or that was resting on the skin of the fruit, does this. This ferment is too small to be seen by the naked eye.

Grapes and apples when ripe are good, healthful fruits. We get no alcohol from eating them. These fruits have a close-fitting skin that keeps the air out. The sugar in a liquid will not ordinarily turn to alcohol if it is kept entirely from the air. When the juice is pressed out the ferments can freely reach it, and then fermentation quickly changes the fluid part of these good fruits to a poison.

Once people did not know that fermentation entirely changes the nature of drinks it acts upon. They thought wines must be good because grapes are; but you know that wine is a poison, because fermentation changes the sugar in the grape juice to alcohol. Wine has ruined many people who, but for it, would have been good and noble men and women.

You will know better than to ever drink it.

A fermentation that produces alcohol is called vinous fermentation.

ACETIC FERMENTATION.

If a fermented liquid, as cider or wine, is left open to the air, another kind of ferment

will appear, and will turn its alcohol to an acid called vinegar. It is not at all like alcohol. One kind of ferment will change good fruit juices to a poison, and another kind will change the same poison to a fluid safely used to flavor food. There is no alcohol in vinegar.

BEER.

Beer is the juice of barley fermented. Barley alone can not ferment to produce alcohol because it is dry ; that is, it has little water in itself, and is made of starch and not sugar. But this starch turns to sugar when a grain of barley sprouts or begins to grow. Men, to make beer, moisten this grain and keep it warm until little shoots start from it and its starch has turned to sugar. Then they heat it hot enough to kill the new sprouts, mash it, and dissolve its sugar out with water and add yeast to make it ferment. Hops that give the bitter taste, are added.

Because the starch of the barley has turned to sugar and then to alcohol, the beer it has made is a dangerous liquor. We should never drink it. In ten cups of beer there is one cup of alcohol, sometimes more. It is the nature of beer to make drunkards of those who take it.

The man or boy who begins to drink beer

never expects to become a drunkard; he intends only to take a little. But it is the nature of the beer to harden his heart and injure his judgment. The liking for it grows as he drinks more and more beer, and he may soon want more alcohol even than he can get in that drink. Thus beer drunkards are made. The first glass of beer may lead to such a fate.

DISTILLATION.

In fermented liquors alcohol is always mixed with water. If such a liquor is heated, the alcohol will turn to vapor before its water will boil.

If this vapor is made to pass through a cool pipe, a liquor stronger with alcohol will drip from the end of the pipe. Thus brandy, whisky, gin, and rum are made. These liquors are about one half alcohol. They quickly ruin whoever takes them. It is the nature of cider, wine, and beer to make the drinkers soon crave these stronger drinks.

THINGS TO BE REMEMBERED.

A poison hurts and kills.

Alcohol is a poison.

Alcohol is made by the fermentation of the sugar in fruit and grain juices.

Fermentation changes the character of the

substance it works upon ; it turns good fruit and grain juices to a poison.

Alcohol is not found in fruits and grains ; their juices must be pressed out before the fermentation that makes alcohol will take place.

Apples, grapes, and grain are good foods, but the cider, wine, and beer made from them are poisonous drinks, because fermentation has turned the sugar in these juices to gas and alcohol.

Because a little alcohol in any drink may make the person who takes it want more and more alcohol, it is never safe to take any at all.

Vinous fermentation makes alcohol. Acetic fermentation makes vinegar. There is no alcohol in vinegar.

QUESTIONS AND ANSWERS.

From what is alcohol made ? From sugar.

Is sugar a poison ? No ; sugar is a food.

Is alcohol a food ? No ; alcohol is a poison.

What does the food we eat do for us ? It builds up our bodies and makes us strong and well.

If a person eats or drinks a poison, what will it do for him ? It will injure his health and may destroy his life.

What poison has injured and destroyed a great many people ? Alcohol.

Could we take so much food that it would hurt us ? Yes ; but that would be our fault. It is the nature of food to help and not hurt us, if we take a proper amount.

What is the nature of alcohol? It is the nature of a little alcohol to injure, and of more to kill whoever drinks it.

Is there any proper amount of alcohol to drink? No; any at all is too much.

What effect does milk have on thirst? It is the nature of milk to satisfy thirst.

What is the effect of alcohol on thirst? It creates thirst.

What is the nature of alcohol in this respect? It is the nature of any liquor that has alcohol in it to make the drinker want more and more, until he cares for nothing so much as to get an alcoholic drink.

How do people often get to liking the strongest drinks? By beginning to take a little beer, cider, or wine; the appetite may grow so fast that in a short time the drinker becomes a drunkard.

Will dry sugar make alcohol? It will not; neither will liquids with too much sugar.

How can alcohol be made from sugar? Dissolve sugar in just enough water, add a little yeast, and let the mixture stand in a warm place.

What will soon be seen in this liquid? Bubbles that make the whole liquid seem in motion.

What are the bubbles? Gas.

What do they show? That the sugar in the liquid is turning to alcohol.

What becomes of the gas and of the alcohol? The gas goes off into the air, but the alcohol remains in the liquid, making it a dangerous drink.

What is fermentation? The process by which sugar is turned into alcohol is one kind of fermentation.

Is there more than one kind of fermentation? Yes; there are many kinds of fermentation, but we here learn of only two of these.

What are they? Vinous fermentation and acetic fermentation.

What is vinous fermentation? The changing of sugar, a food, to alcohol, a poison.

What is acetic fermentation? The change of alcohol, a poison, to vinegar, which is used with food.

What should we ever remember about fermentation? That it changes the nature of the substance it works upon.

To what wrong purpose do men sometimes put fermentation? By fermentation men turn fruit and grain juices, that were good foods, into poisonous drinks.

How is cider made? The apples are mashed and the juice squeezed out; this juice is called cider.

Why is it sweet? The sugar that was in the apples makes it sweet.

How long will it stay sweet? Only about six hours, usually; sometimes not so long as that.

What then happens? If, as usual, it is left open to a moderately warm air, the sugar in the apple juice will turn to a gas that bubbles out of it into the air, and to alcohol that stays in it.

What has this cider become? Hard cider, containing a little alcohol.

How will it still further change? It will quickly grow harder until all the sugar in the juice has turned to alcohol.

How much of such cider is alcohol? One cup in ten is often alcohol, and sometimes more,—enough to make a cider drunkard of the person who drinks it.

Why is it dangerous to drink cider? It is the nature of the little alcohol that it may contain, to make the drinker want more and more alcohol.

How has cider ruined many boys and men? It has given them such a liking for alcohol that they want drinks that are stronger even than hard cider.

What else does alcohol do besides injuring the health? It spoils the character of those who take it. It makes them cruel, selfish, hard, and untruthful.

What especial effect has cider upon its drinkers? It makes them cross and ugly tempered.

What is wine? Fermented grape juice.

Describe this more fully. When sugar, in the juice of grapes or berries has turned to alcohol and a gas, that liquid is called wine.

While the juice is in the apples, grapes, or berries, will its sugar change to alcohol? No; this juice must first be pressed out of the fruit before it will ferment.

Why do sweet fruits make the strong liquors? Because there is much sugar in their juices to turn to alcohol.

How much alcohol is there in wine? Wine is about one part in five alcohol and sometimes more.

Is there any alcohol in grapes and apples? There is none. When ripe, they are healthful foods.

Why does not the sugar while it is in grapes and apples turn to alcohol? Because these fruits have a tight-fitting skin that keeps the air out.

How does that prevent it? The sugar in no liquid will turn to alcohol if it is kept entirely free from the air.

What two conditions are necessary to produce vinous fermentation in fruit juices? The juice must be pressed out of the fruit, and it must be left open to a warm air.

What then takes place? Fermentation quickly changes the fluid part of these good foods to a poison.

What were you told to put into the sugar and water to make the sugar turn to alcohol? Yeast.

Do men put yeast into grape and apple juice to turn them into wine and cider? They do not; but there must be something to take the place of yeast.

In making wine and cider, what takes the place of yeast? A ferment floating in the air or that was resting on the skin of the fruit, goes into the juice and makes the whole ferment, that is, makes the sugar turn to gas or alcohol.

What did people once think? That, because grapes and apples are good, cider and wine made from them must be good also.

What has wine done to many people? It has ruined many who would have been good and noble if they had never used it.

Why should you not drink wine? Because there is alcohol in it.

What is the fermentation called that produces alcohol? Vinous fermentation.

If a fermented liquor is left open to the air, what happens? Another kind of fermentation will take place.

What will this new fermentation do? It will change the alcohol to an acid called vinegar.

Is vinegar like alcohol? No; there is no alcohol in vinegar. Alcohol is a poison, and vinegar is used with food.

What kind of fermentation is this? Acetic fermentation.

What is beer? Beer is fermented barley juice.

Why will not barley alone ferment? It is dry, and it is made of starch which must be first turned to sugar.

How does starch turn to sugar? When the barley sprouts or begins to grow, its starch turns to sugar.

How do men do this? They moisten the grain, and keep it warm until little shoots start from it.

How do they prevent its growing too much? They kill it by heating as soon as the starch turns to sugar.

What is then done? They mash the barley, that the sugar in it may be soaked out with water.

What makes this liquid ferment? Yeast is added.

Why should you never drink beer? Because it contains alcohol, and is therefore a poisonous drink.

How can you be sure that you will never become a drunkard? By never drinking any thing with alcohol in it.

What does the boy or man who begins to drink beer expect to do? He intends to take only a little.

What can you say about the appetite for beer? Because of the alcohol in it, the drinker wants more and more.

Why should you not take the first glass of beer? Because it may lead one to become a beer drunkard.

With what is alcohol mixed in fermented liquors? Water.

How are stronger liquors made? By heating fermented liquors. The alcohol turns to vapor before the water will boil. This vapor passes through a cool pipe, where it turns to a fluid and drips into some vessel.

How is it unlike the liquor that it came from? It is much stronger with alcohol.

What are such liquors called? Distilled liquors.

Name some of these. Brandy, whisky, rum, and gin.

What proportion of them is alcohol? About one half.

What is their nature? To quickly ruin whoever drinks them.

Why do persons wish to drink such strong liquors? Usually they begin with drinking cider, wine, or beer, and these make a person want drinks stronger with alcohol.

Plate I.



BONES.

CHAPTER III.

THE FRAME OF THE BODY.

ON the opposite page, Plate I, we see how the bones are placed in the body.

As the strong timbers of a house give it shape and support the other parts, so our bones give shape to the body. They support the soft portions, and protect the delicate parts from injury.

We can not see our bones, for they are covered with flesh and skin. We may feel them.⁵ If we grasp the wrist, the hand, or the leg, we shall feel the bones to be hard like sticks of wood.

The skull is a strong box for the brain. The bones of the chest form a bony cage for the heart and lungs. The bones of the back and hips support us when we sit or stand. The bones of the legs hold us while we walk or run. The bones of the arms enable us to reach the hand about as we wish.

There are more than two hundred bones in the body, all nicely fitted together in joints, so

that they move smoothly on one another. If we move the fingers or arm, we shall see how easily the joints bend.⁶

The bones are very hard and strong because they are partly made of lime. They are almost as hard and strong as iron, yet they are nearly as light as wood.

HOW THE BONES GROW HARD.

When we are very young, our bones are quite soft. As we grow older, they become hard and strong by taking lime into themselves from the food we eat.⁷

To have strong and healthy bones, we must eat enough of good food. We must take exercise in the outdoor air, and let the sunshine get to us, else the food we eat can not do us much good.

WEAK BONES.

Some children who live on very poor food do not get enough lime, and their bones remain soft and weak. Such children can not walk and play as we do, for their bones will bend under the weight of the body.

Some men who work in dark mines or who live in damp, close rooms do not have strong bones because they do not get the pure air and sunlight.

Our bones may be broken by hard strokes and heavy falls. It is a great misfortune to break a bone.

BROKEN BONES.

We may suffer much pain, and it is often difficult to keep the bone in its right shape while the broken ends grow together.

Sometimes the ends of the bones at a joint are forced to slip apart. This is a painful injury, and one that weakens the joint.

We should be careful not to leap from high places, not to climb where there is danger of falling, and not to engage in rough sports that may break our bones or injure our joints.⁸

TIGHT SHOES.

Many persons give the bones of the feet a wrong shape by wearing tight shoes. They crowd their feet into shoes that give the bones no room to grow.

In this way the toes become cramped into odd shapes, and the whole foot is more like some queer club than like a real foot.

The pressure of the shoe makes painful corns on the feet.

The Chinese women take great pride in having small feet. They begin when little girls to have their feet tightly bandaged, so



A CHINESE WOMAN.



THE DEFORMED FOOT.

that they can not grow. A fully-grown woman will have feet no longer than a baby's. Sometimes these ladies can not stand because their feet are so small. (See page 42).

We should wear easy-fitting, broad shoes with low heels. Then our feet will be well-formed, and be free from corns.

HOW SOME INDIANS MAKE THE HEAD FLAT.

The Indian mother carries her baby on her back. For this reason she ties the child with its back to a long, flat piece of wood, and wraps it with a shawl. When she takes the baby from her back she can lean it against a tree.

With the tribe known as the "Flat-Heads," another small piece of flat wood was tied against the fore-



A FLAT-HEAD WOMAN AND CHILD.

head of the child so that pressure was made on the skull. The bones of the skull would yield to this pressure, and the front part of the head become flat like the wood. Afterwards the head would retain this flat shape for life.⁹



HOW TO HAVE A FINE FORM.

Every boy and girl should wish to become a straight, strong person.

To do this we must hold the body erect, keep the head up, the chest full, and the shoulders level and well thrown back.¹⁰

By keeping one's self in this position, the bones will grow into their proper shape and give the body its natural and beautiful form.

We must be careful, therefore, how we sit

and stand, how we hold the body when we walk, and how we lie when in bed.

By holding the shoulders back and making the chest large we give more room to the lungs and heart. We breathe more air. We have better blood. Our food is better prepared in the stomach.

While we are young the bony frame is growing, and the bones will easily take the shape we wish to give them. This is the time for us to fix the habit of an erect position. Whatever shape we give our bodies in youth, they will retain when we are grown.

EFFECTS OF TOBACCO AND ALCOHOLIC DRINKS.

Tobacco contains a poison. When persons smoke or chew tobacco, this poison enters the blood and is carried all over the body.

When poisonous blood enters the bones it tends to stop their growth. Boys who use tobacco often do not grow to their full size, but remain stunted for life.¹¹

Beer, wine, cider, whisky, and such liquors, contain a poison called alcohol. The drinking of such liquors, therefore, poisons the blood and tends to stop growth.

No boy who wishes to have a large, strong body, should use tobacco or alcoholic drinks. These poisons injure both the body and the

mind, and are wholly unfit to be taken into the body.

THINGS TO BE REMEMBERED.

The bones give form and size to the body.
The bones grow strong by proper exercise.
The bones need good food and pure blood.
The bones are injured and their growth checked by tobacco and alcoholic drinks.

QUESTIONS AND ANSWERS.

What are our bones? They are the hard parts of the body.

Why are the bones hard? They are partly made of lime.

How do the bones get the lime? From the food we eat.

How may we have strong bones? By eating good food and by taking exercise.

What are the bones for? To give shape and support to the body.

What else are the bones for? To protect the delicate parts.

What is the skull for? To hold the brain.

What are the ribs for? To form the chest.

What are the back bones for? To support the body.

What are the leg bones for? To aid in standing and walking.

What are the arm bones for? To move the hand about.

How many bones have we? Over two hundred.

How are they fitted together? In joints.

Why do some children have weak bones? They have poor food.

Why do some men have weak bones? They do not have pure air, or they use tobacco or alcoholic drinks.

How may we injure the bones? By leaping or falling from high places.

In what other way may we injure the bones? By rough sports.

How may we give the body a bad form? By sitting or standing in a stooped position.

How may we have a fine form? By holding the body erect.

What kind of shoes should we wear? Easy-fitting shoes, with broad soles and low heels.

What makes corns on the feet? The pressure of tight shoes.

How does tobacco hurt the bones? It injures the bones and hinders their growth.

How does alcoholic liquor injure the bones? It makes the blood impure, and bad blood makes weak bones.

Why should no one use tobacco or alcoholic drinks? Because these substances weaken the body and mind.

CHAPTER IV.

THE MUSCLES AND STRENGTH.

PLATE II shows us the muscles. If the skin were taken off, the muscles might be seen as here shown. They are the lean meat of the body, and are made of tough threads so that they are very strong.¹²

The muscles move the bones and bend the joints.¹³

If we wish to raise the hand the muscles on the front of the arm become short and draw the hand up. By grasping the arm we may feel the muscles move as they draw upon the bones.

WHAT THE MUSCLES DO.

The muscles do many curious things for us. They form the heart, and by its beating send the blood through the body. They form the stomach, and by its motions help to prepare the food. They move the chest when we breathe. They move the jaw as we chew.

The muscles move the tongue and lips when

Plate II.



MUSCLES.

we speak, the cheeks when we smile, and draw the brows together when we frown.

The muscles move our legs in walking. They help the bones to hold the body erect when we stand, and to bear the burdens that we carry.

When we write or draw, the muscles move the hand and the fingers. In all we do, whether at work or play, the muscles make every motion.

The muscles cover the bones with flesh, and give roundness and fullness to the various parts of the body. By their graceful shape and action they give the whole body its pleasing appearance of life and strength.

HOW TO MAKE THE MUSCLES STRONG.

To make the muscles strong we must use them. The muscles that are most used become the strongest; those we use least will be the weakest. The arm we use the more will be the stronger.

The arms of the blacksmith are very strong, because he uses them so much. Ours are weaker than his, because we use them so much less.

The man who works at healthful labor during the day grows strong; the idle man becomes weak. The boy who works and plays

in the open air is strong, but the boy who sits indoors and does not take exercise becomes weak.

After our muscles have been used they need to be rested. To use them too long or too severely will make them tired and sore.

The muscles depend on the blood to keep them healthy, to make them grow, and to give them strength. If, then, we would have strong muscles we must give them pure blood, and to do this we should eat enough good food.

HOW A STRONG ARM BECAME WEAK.

A stout boy broke his right arm by accident. The broken bones were put in proper place again, and his arm was tied in a stiff bandage so that the bones might mend. The arm was bound to the boy's side for several weeks, and the muscles were not used during this time.

When the arm was well and was unbound, the boy could scarcely lift it or move it in any way, because the muscles had grown so weak from want of exercise. By using the muscles of the arm it was not many weeks before they were strong again.

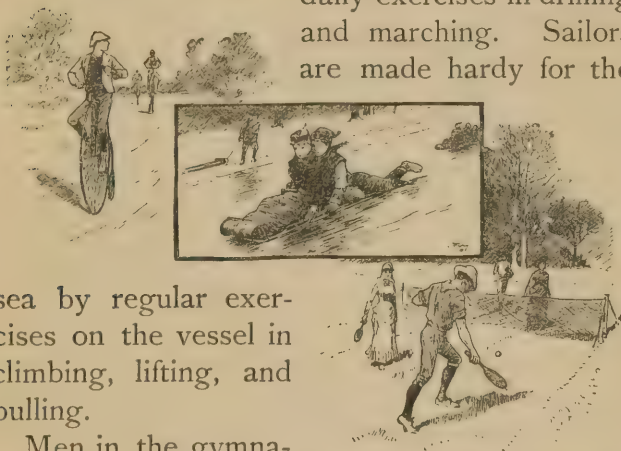
HOW MEN ARE MADE STRONG FOR RACES AND GAMES.

Men who are to take part in races and games make themselves strong by exercising

regularly in the open air for many weeks before their strength is to be tried.

Boatmen make their bodies strong by rowing. Bicycle riders practice riding. Ball players prepare for their games by batting, catching, throwing, and running.

Soldiers are made strong for the army by daily exercises in drilling and marching. Sailors are made hardy for the



sea by regular exercises on the vessel in climbing, lifting, and pulling.

Men in the gymnasium gain great strength by leaping, swinging, climbing, and turning.

In all these cases in which men wish to become strong, they use their muscles properly. They take exercise at the right time. They do enough, but not too much.

Men who wish to become strong take great care in their eating and drinking. They eat only such plain food as will make good blood

and aid in giving them strength. They do not use wine, beer, or whisky, because these alcoholic drinks make bad blood and weak muscles. They do not use tobacco or any other kind of poison.



HOW WE SHOULD TAKE EXERCISE.

It is best to exercise regularly every day in the open air and sunlight. Moderate exertion is better than violent movements. Use many muscles at a time. Often change one kind of action to another.

Brisk walking is one of the easiest and best of exercises. Pleasing outdoor games are the finest of all for boys and girls.

There are things we should avoid.¹⁴ We should not work or play too long without resting. We should not make the muscles very tired. We should not make ourselves too

warm. We should not "cool off" too soon. We should not sit on the damp ground to rest. We should not exercise just before or just after eating. We should not try to do things that are beyond our strength.



THE KING AND HIS MAGIC CLUBS.

A king who was feeble and ill because of ease and idleness, called upon his doctor for medicine.

The doctor was wiser than the king, and knew that it was not medicine, but healthful exercise that the king needed.

The king would not walk or work, however, like the strong men about him. The doctor, therefore, prepared two heavy clubs of strange wood for the king's use, and led him to think that the handles of these clubs contained the medicine for his cure.

To get the benefit of the medicine in the clubs, the king must grasp them by the handles, swing them and play with them until his hands became moist from exercise, at which time the medicine would pass into his hands, and make his body strong.

The king was easily deceived in this manner by the faithful doctor, and each day he might be seen in the open air at certain hours, working manfully with his magic clubs.

His muscles grew strong, his blood became pure, and his appetite for food increased. His health was much improved, and he greatly praised the medicine of his clubs and the wisdom of his good doctor.

The king never learned from his faithful servant that the clubs were nothing but wood, and that the secret of their wonderful cure was found in his own healthful exercise with them.

THE EFFECTS OF TOBACCO AND ALCOHOLIC LIQUORS. X

Some persons think they can make themselves strong by using beer, cider, wine, whisky,

and other alcoholic liquors. This is a great mistake. The alcohol in all of these drinks makes bad blood and injures the muscles and other parts of the body. These drinks make the hands tremble and the steps unsteady.

Such drinks, and especially beer, tend to change the strong flesh of the muscles into unhealthful fat. Because he gets fat, the drinker may think the beer is good for him. But the alcohol in it is not a food. It is a poison. A person thus fattened can not endure hard work. If his flesh is cut or hurt, it requires an unusually long time to heal. If he gets sick, he recovers more slowly than a person not poisoned with drink.

The muscles of the heart are often changed by alcohol, and the heart becomes soft and weak.

Tobacco also injures the blood, and hence weakens the muscles.

THINGS TO BE REMEMBERED.

The muscles move the body.

The muscles give the body its graceful, rounded curves.

The muscles require good food and pure air.

The muscles grow strong only as they are properly used.

The muscles are weakened and injured by alcoholic drinks and tobacco.

QUESTIONS AND ANSWERS.

What are the muscles? The lean flesh of the body.

Of what are the muscles made? Of tiny, tough threads of flesh.

What are the muscles for? To move the bones and other parts.

How do we control the muscles? By the nerves that connect them with the brain.

What do the muscles of the heart do? They make the heart beat.

What do the muscles of the chest do? They enlarge the chest so as to draw in air when we breathe.

What do the muscles of the stomach do? They move the stomach in its work upon the food.

What do the muscles of the arms do? They move the arms and hands.

What do the muscles of the legs do? They move the legs as in walking and running.

How are the muscles made strong? By being rightly used.

What muscles are the strongest? Those we use the most.

What muscles are the weakest? Those we use the least.

When will our right arm be the stronger? When we use it more than the left.

What boys will grow strong? Those who work or play in the open air.

How are men made strong for races and games? By proper exercise.

How was the weak king cured? By exercise.

What is the simplest kind of exercise? Brisk walking.

What is the best exercise for children? Pleasant outdoor play.

How may we injure the muscles in exercise? By doing too much without resting; by trying to do things that are beyond our strength; by very violent actions.

How may our muscles become weak? By idleness, sickness, poor food, or impure blood.

How do alcoholic liquors injure the muscles? They make bad blood for the muscles, and change the strong flesh of the muscles to unhealthful fat.

How does tobacco injure the muscles? It poisons the blood, and makes the muscles weak.

How do tobacco and alcohol affect the growth of the body? They tend to stop all parts from growing.

CHAPTER V.

THE SKIN.

THE skin forms a thin, soft cover for the body. The skin is very tough, and protects the tender flesh beneath it.

If we prick the skin with a pin, we feel sharp pain, because we injure the tiny nerves that partly fill the under portion of the skin, and which connect it with the brain. By these little nerves in the skin we know when any thing touches us. In this way we are said to feel through the skin.

We dread pain, and for this reason we try to avoid having any thing injure our skin. If we burn the skin, we are careful not to do so again. In this way the skin causes us to protect our whole body from harm.

The outside part of the skin is scaly and has no nerves. This outer portion shields the little nerves beneath, and permits us to touch and handle ordinary objects without pain.¹⁵

To break or cut this outer layer of the skin causes the nerves to smart. When the outer

coat of the skin is unbroken, we may handle many kinds of poison without danger of their harming us.

The outer portion of the skin is constantly wearing away on the outside, but it keeps growing from beneath. By this change our outer skin is made new for us every few days.

If we cut through the skin, it will bleed. This shows us that the blood flows in the skin. The little tubes in which the blood flows are so near to one another, that if we prick the skin deeply with a needle on any part of the body, we shall break some of these tubes, and the blood will run out. The skin is kept warm by the blood, and grows by being fed by it.

The skin has many thousands of little tubes in it that open upon the outer surface. The mouths of these tubes are called the pores of the skin.¹⁶

The tubes and pores of the skin are very useful, for, as the blood flows through the skin, these tubes permit some of the watery part of the blood to flow out upon the surface of the body. When we are very warm, this water from the blood flows out so fast through the pores that we may see it. We call it sweat or perspiration.

The perspiration makes us cool when we are too warm. The blood itself is made pure by

having the perspiration and other waste matter taken from it. Perhaps half of the impurities of the blood are thrown out of the body by the skin.

How important is the skin! It protects us from injury, it gives us feeling, it aids in warming us when we are cold, it cools us when we are too warm, and helps to purify the blood. We ought to take good care of the skin so that it may be clean and healthy.



BATHING.

We need to bathe the skin to keep it clean. If we wash it freely with water and soap, and

rub it well with a cloth or brush, we shall take off the old scales of the outer skin and the impurities thrown out from the blood. If the little holes in the skin become stopped, we may be sick, because the blood is not then purified as it flows through the skin. We must keep the pores open.

Bathing will not only make the skin soft and clean, but will make it strong so that we shall not so easily take cold, and will do much to protect us from disease.

HOW TO BATHE.

We ought to bathe quite often, certainly as often as once each week in all seasons of the year. We may use water that is cold or warm, and soap may be added to loosen the oil from the skin.

It is more pleasant, and we are less liable to take cold, if we bathe in a warm room. In any case we must wash the skin well with a cloth or brush. When the skin is clean we need to rub it briskly with a towel until it is dry and warm. Even if the water has caused us to feel chilly, the brisk rubbing will make us warm again.

We need to dry the feet well, and also the hair about the neck and ears. We shall not take cold if we rub every part of the skin until it is dry and warm.

By putting on clean clothing after the bath, we shall be new persons both in appearance and in our own feelings. We should remember that bathing is almost the only way of cleaning the skin.

We should not bathe just after eating, nor when we are very tired. If we are very warm, it is not safe to bathe until we have cooled off. Sudden chill may come upon us by going into the water while we are very warm. We should not remain in the water too long at a time. Sometimes serious illness is caused by remaining in the water until chilled.

CARE OF THE HAIR.

The hair is a part of the skin, and, like the skin, it needs proper care to keep it clean and pretty.

The hair grows from the skin, and is oiled by tiny oil-glands in the skin near the roots of the hair. This oil from the skin is sufficient to keep the hair soft and glossy without our putting grease or oil on it.

The comb and brush are all that we need to use upon the hair, if we will use them well.

The skin at the roots of the hair often becomes coated with scaly dandruff and oily dust. At times this dandruff may need to be washed out, or it may be removed with a fine-toothed

comb. Careful, tidy persons will not permit the skin of the head to become coated in this way.

Well-kept hair is one of the most beautiful ornaments of the body.¹⁷

CARE OF THE NAILS.

The nails, too, are a part of the skin, and grow from it. They are intended to shield the ends of the toes, and to make the fingers firm so that we may pick up small things, and grasp objects more firmly.

The nails grow out rapidly, and need to be cut away often. Long nails are ugly.

We should not let a line of black matter remain under the outer end or around the edge of the nails. A stiff brush can be used to clean the nails when we wash the hands, and we may trim the ends with knife or scissors.

We should not cut the nails too short, nor should we bite or tear them.

By pressing the skin loose from the root of the nail, we shall not have "hang-nails."

CARE OF THE TEETH.

We use the teeth in chewing our food and also in speaking. We must take good care of them and keep them clean, or they will decay and we shall lose them.

To clean the teeth, we need to brush them well once or twice each day with a soft brush and water until they are smooth and white. We may need to rub them, now and then, with ground chalk or charcoal to take away the yellow spots that come upon them.

After eating, we should use a quill or a piece of wood and pick away any bits of food that may have remained between them.

If the teeth decay so that there are holes in them, we should at once have a dentist cut out the decaying part, and fill the hole with gold or other suitable metal. This may stop the tooth from decay, and cause it to last us for many years afterwards.

Our first teeth come when we are very young, and last only a few years. The second teeth begin to come when we are about nine years old, and are to serve us the remainder of our lives. You can see, then, how necessary it is to take the best possible care of them.

If we would have good teeth, we must keep them clean with brush and tooth-pick. We should not crack nuts with them, nor use them as scissors for cutting threads. We should not scratch them. We should not chew ice or snow. We should not let very hot food or drink touch them. We should not breathe through the mouth, nor sleep with the mouth

open. We should not stain the teeth by chewing tobacco or smoking cigars or cigarettes.



OUR CLOTHING.

Our clothing protects us from cold in winter, and from heat in summer. Good health requires that we shall wear clean clothing. By learning to dress the body properly, we may often avoid taking cold.

The clothing touches the skin, and in this way becomes filled with moisture and impurities from the body. This is especially true of the under-clothing. The clothes worn next to the skin should be changed as often as once a week.

When we prepare to sleep, we should take off the day-clothing, and put it where it may dry and get the fresh air during the night.

Sleep in clean night-garments, and in the morning be careful to turn the bed-clothes back so that the entire bedding may be well aired before being put in order.

Admit the fresh air and sunlight into the bedrooms, for it is unhealthful to sleep in damp or close rooms.

If we live in a cold climate, we should wear woolen clothing next to the skin in wintry weather. As a general rule, flannel is best for winter, and cotton for summer. A light suit of flannel worn next to the skin will protect one from chill in any season when the weather is changeable.

Loose clothing is warmer than that which fits closely.

In very cold weather we should dress the feet and hands as carefully as we do the other parts of the body. It is wrong to wrap the chest, neck, and head in thick, warm clothes,

and leave the wrists, hands, ankles, and feet exposed to the cold.

Thin stockings, and shoes tightly laced about the ankles and feet are poor protection. Here is an old saying that is quite true:—

“Keep the feet warm and the head cool,
You will always find a wholesome rule.”

THINGS TO BE AVOIDED.

We should not wear damp clothing.

If the clothing gets wet from any cause, we should not let it dry on the body, for this will chill the skin.

We should not wear a wet or damp hat.

We should not sit in school or elsewhere with wet shoes and stockings. Either change them for dry ones, or dry the feet well by a fire.

Rubber overshoes for wet weather are a great protection to the feet, but they should not be worn in the house.

If we have been playing or working until the clothing is damp with perspiration, we should not “cool off” too quickly.

We should not clothe one part of the body warmly, and leave another portion exposed.

We should not change suddenly from thick, warm clothing to light, cool garments.

HOW A MAN LOST HIS LIFE.

A man who was fishing, slipped on the bank of the river and fell into the water. Instead of hurrying home to change his wet clothing, he continued fishing and let the clothes dry on his body.

From this unwise action he took cold, became sick, and, after an illness of three days, died. His death was a great loss to his wife and children. He might have saved his life if he had put on dry clothing.

A COLD, AND HOW TO RELIEVE IT.

We usually take cold by having the skin of some part of the body chilled. This chill causes the skin to shut its pores, and perspiration does not flow through it freely. The impurities that the skin should throw off are now kept in the body, and give us what we call "a cold."

We may also take cold by getting the feet wet, by sudden cooling of the skin after exercise, by sitting or lying on the damp ground, by sitting in a draft, or by wearing damp clothing.

We can not cure a cold at once. We must expect to get well slowly. To relieve the cold, we should open the pores of the skin by warm

bathing and by rubbing. Keep the skin warm, and take such exercise as shall cause the blood to flow freely.

WHAT TO DO WHEN BURNED.

If we burn the skin, we shall feel great pain. To stop the pain, we may cover the burned part with a paste of flour and water, or of soda and water. If we wrap the burn in a thick cloth and keep it very wet, the pain will nearly stop. If it is the hand or the foot that is burned, we may put it into a basin of cold water; this will entirely stop the pain.

Keep the air away from the burn for a few hours, after which we shall feel no pain. It may take several days for the sore to get well.

EFFECTS OF TOBACCO AND ALCOHOLIC LIQUORS.

Tobacco makes bad blood, and in this way gives the skin a dull and sallow appearance. Tobacco-smoke clings to the clothing and gives it a bad smell.

Alcoholic liquors make the skin red. The man who drinks such liquors has flushed cheeks, a red nose, and bloated eyes, because the alcohol so affects the heart and blood-vessels that too much blood is sent near the surface of the body, and shows through the skin, which is also thereby injured.

THINGS TO BE REMEMBERED.

Health requires a clean and healthy skin.
To have a healthy skin, we must bathe it properly.

Dress in clean clothing, exercise in pure air and sunlight, and avoid alcoholic liquors and tobacco.

QUESTIONS AND ANSWERS.

What is the skin? It is the covering of the body.

How does the skin protect the body? The skin is tough.

How do we know when any thing touches us? By the nerves in the skin.

How does the skin warm us? By checking perspiration.

How does it cool us? By allowing perspiration to flow.

How does the skin grow? It is fed by the blood that flows in it.

What are the pores of the skin? They are tiny holes in it.

What are the pores for? They cast the impurities and perspiration out of the blood.

Why should we keep the pores open? To purify the blood.

Why should we bathe? To keep the skin clean and the pores open.

How often should we bathe? At least once each week.

How may we avoid taking cold from bathing? By rubbing the body until every part is dry and warm.

How should we take care of the hair? Keep the skin of the head clean, and use comb and brush for the hair.

How should we take care of the nails? Keep them clean, and trim them as they grow long.

What are the teeth for? For chewing food, and to aid in speaking.

How may we take care of them? Keep them clean with brush and pick.

What should we do if the teeth decay? Have a dentist fill them at once.

What makes "toothache"? The tiny nerves inside the tooth are hurt.

What is our clothing for? To warm us in winter, and keep us cool in summer.

Why should we wear clean clothing? That we may have good health.

What five good doctors should we have? Clean skin, clean clothes, pure air, sunlight, and exercise.

Why must we change our clothing? Because it becomes unclean.

What clothing needs the greatest care? Our under-clothing.

How often should we change our under-clothing? Every few days.

How should we dress for sleeping? In clean night-garments.

What kind of clothing is best? Flannel for winter, cotton for summer.

What clothing must we not wear? Damp clothing.

How do we usually take cold? By chilling the skin.

How may we relieve a cold? By opening the pores of the skin.

What shall we do for a burn? Keep the air from it.

How does tobacco affect the skin? It makes the skin dull and sallow.

How do alcoholic drinks affect the skin? They weaken the blood-vessels, and thus let too much blood come to the skin, making it look red, and injuring it.

CHAPTER VI.

THE BLOOD.

IF we cut through the skin, the blood will run out in drops, or in a stream if the cut is large and deep.

This red fluid that we call the blood flows through the body. It is made from the water we drink, the food we eat, and the air we breathe.

The blood gives life and strength to the body.

The blood builds up the body.

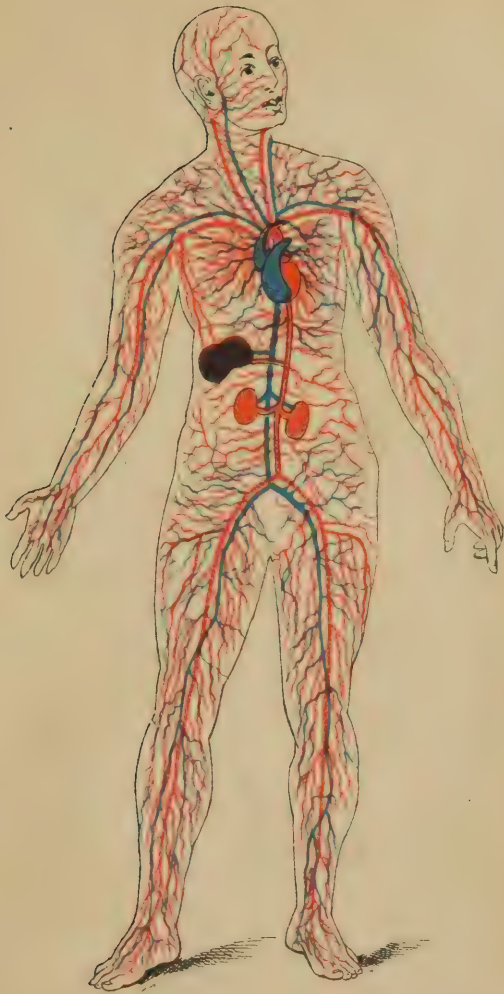
The blood cleans the body.

The blood warms the body.

The large figure, Plate III, shows us the heart and the tubes through which the blood flows.

The bright red lines are the tubes in which the pure blood flows as it comes from the lungs, and is forced away by the heart to do its work in every portion of the body.

The blue lines are the tubes that bring the impure blood back to the heart and lungs.¹⁸



ORGANS OF CIRCULATION.

THE HEART.

The heart is in the chest. By putting the fingers on the left side of the chest, we may feel the beating of our heart; or, by putting our ear against the chest of another person, we may hear the beating of his heart.

If we count, we shall find that the heart beats about eighty times every minute. The heart beats more rapidly in childhood than when we are grown. It is the beating of the heart that sends the blood through the body.¹⁹

The heart is like some busy pump that throws a rapid stream of water; only the heart pumps the blood, and forces it into the tubes that convey it to the different parts of the body.²⁰

The heart closes suddenly and forces the blood out, then rests an instant to be filled again. It now forces the blood out again, and rests. Thus it works and rests every moment of our life. If it were to stop for one minute, we would die.

Exercise causes the heart to beat more rapidly and the blood to flow faster. In this way the blood is made purer and our body becomes warmer. We must be careful, however, not to make the heart beat too fast by violent exercise.

The heart is made of muscle, and to be strong it must have pure blood. Bad blood makes the heart weak. /

THE STORY OF A DROP OF BLOOD.

A boy, as he sat in school one day, pricked his finger with a pin so that a drop of blood came out where the pin had torn the skin.

"This drop of blood tells me a pretty story," said his teacher, "and if you will listen, I will tell you what it says to me."

"I am only a drop of blood, little man, but when you have heard my story, I am sure you will think I am of some service to you.

"In some way that I can not tell, I was made to-day from the bread and milk that you ate for your breakfast, and the pure air that you breathed as you came to school.

"I came into one of the rooms of your busy little heart, and, along with many other drops, I was sent out with a merry bound through the tubes that lead to your right hand.

"I was of a bright red color when I started, but as I passed through the skin, the bones, and the muscles, these parts picked me to pieces, for they were hungry and I had to feed them. I was glad to give them a part of myself, as I was strong and pure, while the bones and muscles were hungry and unclean.

“When I had passed slowly through the smallest of these tubes, I began to move back toward the heart. I was now impure, and of a blue color.

“I was pleased to reach the heart again, but was surprised to find, that, along with the other blue drops, I was brought into a strange room.

“There were so many of us, that we soon filled the heart, whereupon it gave us a squeeze and threw us into a tube that took us to the lungs.

“It was a delightful place in your lungs, for the air you were breathing took away my blue color. I lost some of my impurities, and took into myself some of the air, which made me bright and new. This caused me to feel strong again and ready to do more work.

“Back to the heart I came, into the room from which I had first started. I was sent out again in a great hurry, and this time I took the tube that carried me into your brain.

“When you were busy thinking and studying, I was helping to keep your brain in good order so that you could get your lesson well.

“When my task was done, I returned to the heart and again to the lungs to be renewed.

“My next trip was made to your stomach to aid in getting the food that you ate for dinner ready to make new blood.

“I was surprised to find that I myself grew strong from the good food that you had eaten, and when this task was done, I was glad to help once more to build your body.

“How long I might have continued to work in this way, I may not know, for you let me out with that pin, and I could do no more than tell you this story about myself.”

CARE OF THE BLOOD.

We must use good food and drink, for these make the blood. To purify the blood, we need to breathe the fresh air, exercise in the sunlight, and keep the skin and clothing clean.

Clothing that binds any part of the body too closely, prevents the blood from flowing freely; for this reason we should avoid wearing closely-laced shoes, tight garters, and clothing that binds the waist.

If we make small cuts in the skin, the blood will flow out quite fast. By pressing lightly on the cut or wrapping it in a bandage, the bleeding will stop. In case of dangerous cuts we may need to make heavy pressure on the cut tubes in order to stop the blood.²¹

EFFECTS OF ALCOHOLIC LIQUORS.

Alcoholic liquors make the heart beat too fast, and thus become overworked. These liquors often make unhealthy fat in the heart. Alcohol often makes the blood too thin, and in some other ways changes it so that it can not so well carry the right food to every part of the body and keep us in good health.

Men have supposed that they might bear great cold and hardship better by using alcoholic liquors. This is a mistake. The face flushes and looks red after a glass of wine is drank, because alcohol makes more blood rush into the little blood-vessels in the skin. The drinker at first feels warmer. His skin may be warmer for the time, but this blood that has rushed to the surface would have kept warmer if it had gone on its way in the blood-vessels that are deeper in the flesh. Alcohol has brought it to the surface, where it quickly cools off and the drinker is colder for his alcoholic drink.

In cases of great hardship the first men to become weak are those who use alcoholic liquors. Alcohol adds nothing to the strength, and it can not take the place of proper clothing, good food, and exercise in keeping the body warm.

THE ARCTIC EXPLORERS.

Many years ago Dr. Hayes, in charge of a company of men made a journey into the icy regions of the North. He and his men had to dress in furs, and to eat fatty food to keep them warm. Some of his men tried to keep



warm by drinking whisky. The men who used the whisky were so injured by it that they did not withstand the cold as well as the men who were temperate.

Dr. Hayes says that wine, rum, whisky, and other alcoholic drinks are not only useless to Arctic travelers, but they are positively injurious.

THE UNION SOLDIERS.

At one time during the Civil War when the Union army was doing very hard service, the surgeon in charge thought he would benefit the men by giving them a daily supply of whisky. This not only failed to assist the soldiers in bearing the hardships of camp and march, but made them weaker. The surgeon says he hopes such an experiment will never be tried again in the army of the United States; and that he believes alcoholic liquors are not, under any circumstances, useful to healthy men.

QUESTIONS AND ANSWERS.

What is the blood? The red fluid that flows through the body.

What is the use of the blood? It gives the body life and strength.

What does the blood do to the body? It warms, cleans, and builds up the body.

From what is the blood made? From our food and drink, and the air we breathe.

What is the heart? The organ that forces the blood to flow.

Where is the heart? Near the middle of the chest.

How may we know where the heart is? By feeling it beat against the chest.

How often does the heart beat? About eighty times in a minute.

What is the heart made of? It is made of muscle.

How does bad blood injure the heart? It makes the heart weak.

How does exercise affect the heart? It makes the heart beat faster.

What are the blood-tubes? The tubes in which the blood flows.

How may we know pure blood? It flows from the lungs and heart, and is of a bright red color.

How may we know impure blood? It flows toward the heart and lungs, and is of a dark color.

How does exercise affect the blood? It causes the blood to flow faster, and makes it purer.

How does exercise affect the heat of the body? The body is made warmer by exercise.

Why should we not wear tight clothing? Because it partly stops the blood.

What are the things that give us good blood? Good food and drink, fresh air, exercise, and cleanliness.

How do tobacco and alcohol affect the blood and heart? They make bad blood and a weak heart.

How do they affect the heart-beat? Tobacco makes it irregular, producing disease. Alcohol quickens the heart-beat so the heart has not time enough for rest.

How does alcohol affect the warmth of the body? It cools the body, because the increased flow of blood at the surface causes too much heat to pass off from the skin.

Will alcohol help men to better bear the cold? It will not. In cases of great exposure the first men to give out are those who use alcohol.

CHAPTER VII.

THE BREATH.

“THROW open the window and fasten it there,
Fling the curtain aside and the blind,
And give free entrance to heaven's pure air,
'T is the life and the health of mankind.”

The air we breathe is every-where about us. We could not live without it. We must breathe it into our lungs and out again while we work and play, and also while we rest and sleep. Five or six minutes without air would probably cause us to die.

We may notice our own breathing. See how we raise the chest to cause the air to rush into our lungs, and how we press the air out again by making the chest smaller.

If we count our breathing, we shall find that we take the breath about eighteen times every minute. If we take exercise, we breathe more rapidly than we do while we rest or sleep.

The lungs that fill the chest are light and spongy.²²

They are filled with tubes for the blood, and other tubes and rooms for the air. When the air is in the lungs, it is so close to the blood that the air and blood are separated only by a thin membrane no thicker than a very thin sheet of paper.

THE STORY OF A BREATH OF AIR.

"Do you wish to hear what my breath tells me?" asked the teacher, when the pupils were ready for a story. "Yes, yes," was the eager reply. "Listen closely and I will tell you what our breath might say if it could talk."

"I am only a breath of air, but I have much to do with making you well and strong.

"I go in at your nose and down inside your windpipe. When I reach your lungs I pass into a great many tiny rooms that have thin walls. Here I find the warm blood all about me.

"A part of myself, which you call oxygen, goes from me into the blood, and makes it turn to a bright red color. The blood is glad to get my oxygen to carry through your body.

"Some impurities from the blood come through the thin wall into me. I am cool and pure when I go into your lungs, but when I come out, I am warm and impure.

“I am glad to get out of your close, warm lungs into the open air.

“Do not breathe me back into your lungs, for I am not now fit to come near your blood. I have lost so much of my oxygen and am so full of impurities that I will make you weak and sick.²³

“Open the window so that I can get out-of-doors, and let in some fresh air for your breath, so that you may be strong.

“So it is, little children, that all the minutes of your life you are taking breaths like me to aid in making your blood pure.”

WHY CLOSE ROOMS ARE UNHEALTHFUL.

Our breathing makes the air about us impure. As this air is unfit to be breathed again, our rooms should have the windows or doors open sufficiently to let fresh air come in and the impure air pass out.²⁴

Our sleeping-rooms especially need openings for the change of air. We sleep one third of the time, and if our bedrooms are close, the air will become very impure and tend to make us sick.

If we sit in rooms without openings in them, we become dull and stupid. Headache frequently comes from breathing the impure air of close rooms.

We can not work or study well in rooms that do not permit the fresh air to enter.

A VERY SICK MAN.

One warm day in midsummer a poor man lay in a crowded hospital sick with a terrible disease.

The doctors had given up all hope of his getting well, and so they put him in an open shed outside the building, thinking that he would soon die.

Here the poor man received the pure air. He began to grow better very quickly, and it was not many weeks until he was quite well. The fresh air did more for him than medicine could do in the crowded room of the hospital. Sick people need pure air to help them in getting well.

ALCOHOLIC DRINKS AND THE LUNGS.

If we drink wine, whisky, or other alcoholic liquors, the alcohol will cause the lungs to become sore and inflamed.

The lungs begin to throw off the alcohol as an impurity of the blood as quickly as it is taken into the body. We may smell the alcohol in the breath of such a person in less than half a minute after it has been swallowed.

The alcohol of such drinks hardens the delicate air-cells and blood-tubes of the lungs. This prevents the lungs from purifying the blood. Habitual drinkers of such liquors sometimes have what is called "alcoholic consumption." This is an incurable disease of the lungs.

TOBACCO AND THE LUNGS.

Tobacco makes poisonous blood for the lungs. Persons who chew or smoke tobacco often have a diseased mouth and throat. Cigarette smoke is very injurious to the lungs.

If we wish to have pretty teeth, a clean mouth, a sweet breath, pure blood, and strong lungs, we must not use tobacco.

THINGS TO BE REMEMBERED.

The air we breathe purifies the blood in the lungs. To have good health we must have strong lungs. To have healthy lungs :

We must breathe pure air.

We must live in open rooms.

We must live much in the sunlight.

We must wear loose clothing about the chest.

We must stand and sit erect.

We must not injure the blood and lungs by using tobacco or alcoholic drinks.

QUESTIONS AND ANSWERS.

Where is the air? It is every-where about us.

Why do we need the air? So that we may live.

What does the air do for us? It makes our blood pure.

How do we get the air? We draw it into our lungs.

Where are the lungs? They nearly fill the chest.

Of what are our lungs made? Of tubes for the blood, and tubes and cells for the air.

How are the air-tubes and blood-tubes of the lungs placed? Side by side, so that the air may pass through to the blood.

Why should we breathe pure air? Because it will purify the blood.

Why should we not breathe impure air? It will make the blood impure.

What kind of air do we take into the lungs? Pure air.

What kind of air comes out of our lungs? Impure air.

Why are close rooms bad for us? Their air is impure.

What rooms should be open? Sitting and sleeping rooms.

Why should we wear loose clothing about the chest? To give room for the lungs.

Why should we sit and stand erect? Stooping cramps the lungs.

Why should we avoid taking cold? Because it makes the lungs sore.

How does alcoholic drink affect the lungs? It hardens the air-cells and blood-tubes.

How does this hurt the lungs? They can not purify the blood as well.

What incurable disease does habitual drinking sometimes cause? Alcoholic consumption.

What can you say of cigarettes? Their smoke is very injurious to the lungs.

Plate IV.



NERVES.

CHAPTER VIII.

THE BRAIN AND NERVES.

THE figure, Plate IV, shows us how the brain and nerves are placed in the body. The brain fills the skull. Along the back is the large nerve called the spinal cord, connecting with the brain above. On each side we see the nerves that branch off from the spinal cord. These little nerves are like tiny white threads that reach from the brain and spinal cord to every part of the body.²⁵

Some of the nerves connect the brain with the skin so that we can feel when any thing touches us. Other nerves join the brain with the muscles in order that we may move the muscles as we please.

The brain and nerves are the most important parts of our body, for they are what our mind uses when we wish to do any thing. Our bones can not support us, our muscles can not move, our heart can not beat, our lungs can not breathe, our stomach can not do its work, our eyes can not see, our hands can not write, and

our mouths can not speak without the brain and nerves to give them power to act, and to guide them in all they do.

It is by the brain and nerves that we think and feel. They tell us when we are well and when we are sick. They tell us when we are tired and when the body is being injured in any way. They tell us, too, what part of the body it is that is suffering.

WHAT PAIN SAYS.

"Oh, my fingers! my fingers!" cried a small boy who had by accident touched his hand to a hot stove. "Why do they hurt me so much?" he asked as he ran to his mother.

"It is the pain from the burn, my dear. You have hurt the nerves in the finger, and they give you pain," was her answer.

"I wish I had no nerves," said the boy.

"But your nerves are very useful things," she replied, as she wrapped the fingers in a cloth wet with flour and water to stop the pain.

"How can that be, when the nerves hurt me so much?" said he.

"When you put your hand against the hot stove the nerves were burned. The nerves said to the brain, 'My fingers are burning!' The brain told the muscles of your arm to take the hand away at once, and so quickly did the

nerves and the muscles snatch the hand from the hot stove that it was all done in less time than you can wink your eye. It was done so quickly that your fingers were not burned very



badly. If you had no nerves, your poor fingers might have been burned off before you would have known it. It is in this way that our nerves tell us when any part of the body is being injured, and cause us to take care of it."

"But, mother, I don't see why it need to hurt as much as it does. The nerves might feel the burn and might take the hand away without such ugly pain," continued the boy.

"The pain is a good thing, too, my son," said she. "Pain says to you, 'Take care, little man, and remember not to burn your fingers again; don't harm yourself in any way or I'll hurt you.' We dread pain so much that we try to protect our body from every injury."

"I am sure I shall not wish to touch a hot stove again," he said.

"Perhaps you do not know that if you had no nerves and could not feel any pain you would not feel any pleasure, either. When you taste your nice food, when you hear sweet sounds, when you see pretty things, and when you enjoy your exercise and play, the brain and nerves give you all of these pleasures. We have much more pleasure than pain. When we are well, every right thing we do tends to give us pleasure. Pain only comes to tell us when we are doing wrong, and to guard us from injury. Pain, my son, is a very good thing."

CARE OF THE BRAIN.

The brain is the most precious part of the body. It is made of soft, gray matter, and for

its protection it is wrapped in delicate covers, and put in the strong box formed by the skull.

The brain needs good blood to make it well. In order to give it this good blood we must breathe pure air, use proper food and drink, and exercise in the sunlight.

If we sit in close rooms we can not study, for the brain grows dull from want of pure air. If we sleep in close rooms the brain will not be clear and strong when we awake, for it has not been refreshed with pure air during the night.

To make the brain strong we must use it. We must think and study, work and play. But we must not work or study too hard nor too long at a time.

After we use the brain we must rest it. By proper work and rest it will grow stronger day by day. Idleness makes the brain weak. Overwork, great anxiety, and too much excitement may injure the brain so much that we shall lose the proper use of the mind. Long sickness makes the brain weak.

We can rest the brain by sleep or by change of work. Sweet sleep is the best rest for a tired brain. During sleep the blood clears the brain and prepares it for new service. Loss of sleep makes the brain dull. Children need more sleep than older persons because children

are growing and are so very active while they are awake.

If our brain is tired because of hard study in school, we can rest it by taking half an hour of outdoor play. If we are tired from walking or running, we may rest by sitting and reading.

The brain is easily injured by blows on the head and neck. Persons should never be struck about the face or head. Fatal results often come from such blows.

If the brain becomes diseased or is injured by accident or overwork, the whole body and mind will become weak.

When persons become so diseased in brain that they lose the right use of the mind, we say they are insane or crazy. They may then try to kill themselves or others. Such persons must often be kept locked up in strong rooms.

EFFECTS OF TOBACCO AND ALCOHOLIC DRINKS.

Sometimes the nerves are so injured that they lose their power of feeling, or become paralyzed. Both alcohol and tobacco tend to paralyze the nerves, and hence they are called narcotics. When the nerves are thus deadened they lose their power to control the muscles; this is the cause of the trembling steps and unsteady hands of the drunkard.

Tobacco is sure to so affect the nerves and

brain as to blunt the finer feelings of those who use it. You all know that smokers often do not seem to care how they spoil the air for other people, nor how unfit for use sidewalks and floors are made by their presence and habits.

The alcohol of such drinks as beer, wine, and whisky goes through the body, and finds the nerves every-where. The alcohol makes the nerves hard and tough; this robs them of power to feel, and to move the muscles.

Alcohol does its greatest harm to the brain. It injures the delicate substance of the brain, and, by making it hard, tends to destroy the life of the brain.²⁶ The person who has alcohol in his brain can not use his mind rightly, can not feel or think properly. He has really been poisoned, and so is weak and foolish, and often very cruel and wicked. Sometimes such a person is so dangerous that he must be locked up until he gets sober. He is like an insane man. The man who has taken only one glass of wine has alcohol in his brain. We do not usually say he is "drunk"; but the difference is only that between a little poison and a great deal. It is unsafe to trust the judgment of even a "moderate drinker."

Much alcohol so weakens the power of the brain that the person will often fall and lie

in a death-like stupor until the alcohol passes out of his body.

Alcoholic drinks are one of the chief causes of insanity.

Alcoholic drinks cause men to commit many crimes.

At one time six men were held in prison in a large city to be tried for their crime. Each of these men had committed the murder of which he was guilty while under the influence of alcoholic liquor.

OUR SENSES.

We gain knowledge of things by using our five senses: Touching, smelling, tasting, seeing, and hearing.

The hand is commonly used to touch objects and to learn whether they are rough or smooth, hard or soft, cold or warm.

We smell with the nose. It aids us in choosing our food, and in knowing if the air about us is pure.

We taste with the mouth. Taste causes us to enjoy eating, and partly guides us in deciding what kinds of food to eat. If we use much strong seasoning, such as pepper, salt, mustard, and vinegar upon what we eat, we shall lose the taste for plain and simple food. To-

bacco and alcoholic drinks tend to destroy the sense of taste.

We see with the eyes. They are the windows of our brain through which the mind looks out upon the things of the world. Our eyes give us great enjoyment, and by their use we gain much of our knowledge. We ought to take good care of them. We should keep them clean. We should not strain them or use them in any way that will make them tired or give them pain, as in reading or sewing by a dim light. We should not hold the book too near the eyes in reading or writing, as this tends to make us near-sighted. We should shield the eyes from light that is very strong.

If any thing gets under the eyelid, we should not try to remove it by rubbing the eye, but let the tears wash the object out. If necessary, we can raise the eyelid carefully and take the thing away with the corner of a soft handkerchief.

We hear with the ears. They not only enable us to hear what others say to us, but they guide us in the use of our voice. We could not have learned to speak if we had not been able to hear. We should keep the ears clean, but should not pick at them with pins or sticks.

The five senses not only give us knowledge and enjoyment, but they aid in protecting us from harm by showing us the danger so that we may escape it.

We may do much to make the senses quick and sharp by using them properly and by forming the habit of giving close attention to what they tell us.²⁷

HABITS.

By doing any thing often in the same way, we fix the habit of doing it in that manner. By eating rapidly many times, we form the bad habit of eating too fast. By rising early repeatedly, we form the good habit of early rising.

It may be difficult at first for us to do what we wish, but as we repeat the effort, the task becomes less difficult, until at last we shall have formed the habit, and it is done without an effort.

It is difficult to change our habits after they become firmly fixed. It is like changing ourselves to alter our habits. The habits we form in youth often continue with us during the whole of life.

We should be careful to form only good habits, for the bad ones will cling to us and tend to cause us to go on doing what is wrong.

Among the habits we should form are :

Habits of cleanliness.

Habits of temperance.

Habits of industry.

Habits of holding the body erect.

Habits of eating and drinking properly.

Habits of never using alcoholic drinks.

THINGS TO BE REMEMBERED.

We must use the brain to make it strong.

We must rest the brain by sleep and change of work.

We must give the brain good blood.

We must not injure the brain by using tobacco and alcoholic drinks.

CONCLUSION.

We have learned that the body is of great value, and that our enjoyment and usefulness depend upon its health.

We should remember that there is no such thing as chance. Every thing has a cause. We are well because we use the body rightly. We are ill because we do some wrong to it. We can not escape the results of our own actions.

It is much wiser for us to retain our health by proper care than to permit sickness to come upon us by thoughtlessness or neglect.

Let us never use alcoholic drinks or tobacco in any form. This is the only way in which we may be sure that they will never become our masters and we their slaves.

QUESTIONS AND ANSWERS.

Where is our brain? It fills the skull.

Where is the spinal cord? It extends down the back.

Where are the nerves? They join the brain and spinal cord with all parts of the body.

What are the brain and nerves for? They give us feeling and the power to move the muscles.

How does our mind think and study? With the brain.

How do we know when any part of the body is suffering? By the pain from that part.

Why is pain a good thing? It makes us careful not to injure the body.

Why do the brain and nerves require our greatest care? They are the most precious part of the body.

Why does the brain need so much blood? Because it works so much.

Why are close rooms injurious to the brain? They do not give the brain pure blood.

How is the brain made strong? By good blood and proper exercise.

Why should we not use the brain very long at a time? The brain must have rest.

What is the best rest for the brain? Sleep,

What other rest has the brain? Change of work.

What will make the brain weak? Bad blood, idleness, sickness, overwork, excitement, loss of sleep, alcohol.

Why do children need much sleep? They are growing, and are active while awake.

Why is it wrong to strike a person on the head? It may injure the brain.

What causes insanity? Disease of the brain or injury to the brain.

How does tobacco affect the brain and nerves? It makes them dull.

How does alcohol change the nerves? It makes them hard, and thus deadens them.

How does alcohol change the brain? It hardens and tends to destroy the brain.

What are the effects of the use of alcoholic drinks? They tend to make men cruel and wicked, drunk and insane.

How does alcoholic liquor cause men to commit crime? It makes them lose the right use of the mind.

How do we gain knowledge? By using our senses.

What senses have we? Touching, smelling, tasting, seeing, hearing.

With what part do we commonly touch things? With the hand.

With what do we smell? The nose.

With what do we taste? The mouth.

With what do we see? The eyes.

With what do we hear? The ears.

How may we injure our taste? By using much strong seasoning.

How may we injure the eyes? By straining them.

How may we make our senses sharp? By giving close attention to them.

How do we form habits? By doing any thing often in the same way.

What kind of habits should we form? Only good habits.

NOTES.

The following notes correspond in number with the small figures used in the text to which they refer, as on page 9. They are merely suggestive, and are intended to be used at the teacher's discretion.

1. Page 9.—Both teacher and pupils will be interested in telling how the body is like a watch, and how unlike. Also compare and contrast the human body and a steam engine.

2. Page 18.—The poison in tobacco is called nicotine. It benumbs the nerves. Such poisons are called narcotics. Tobacco is one of the strongest of these.

3. Page 19.—Men who have formed the habit of smoking, often use as much as twenty-five cents' worth of cigars daily. This amounts to nearly one hundred dollars per year.

4. Page 20.—Get some alcohol in a vial from a druggist. The children may see that it resembles water in appearance. They may smell it. Pour a portion of it into a saucer and touch a lighted match to it. The alcohol will burn like oil. Jewelers often use it as a burning fluid because it makes a hot, smokeless flame.

5. Page 39.—The children know what is meant by the head, but they need to feel the hard bones of the skull, tell its shape, and learn that it contains the brain. Putting the hand on the skull at the time helps to interest the child, and to fix the instruction in his mind.

So, too, the children need to touch the chest, and notice its actions in breathing. Require the pupils to count the bones in a finger, in the palm of the hand, in the forearm, and in the arm.

6. Page 40.—The pupils may observe their own joints in the fingers, wrists, elbows, shoulders, knees, neck, etc. Notice the difference in the joints, and name such as work like hinges. A joint from the leg of a sheep or other animal, something the butcher will be pleased to give away, may be used with the class.

Cut the joint open, see how strongly the bones are united by ligaments, how nicely the ends are fitted into each other, and how smooth the ends are.

7. Page 40.—Show the class a human bone and remind the pupils that it was once a part of a living person. Bones from ordinary domestic animals are almost perfectly like our own. Roast a bone for three hours in the ashes of a fire, and it will become white and brittle. This will show the lime of the bones.

Put a bone for several days in weak acid, one part muriatic acid and seven parts water. This will dissolve the lime and leave the animal portion of the bone soft like rubber. From these two preparations the composition of bones may be taught.

8. Page 41.—Children are often disposed to do perilous things without thinking of danger. Broken bones and sprained joints are serious injuries. Teach the pupils how hazardous it is to climb trees, to walk on the tops of fences, to leap from high places, to run on stairways, to wrestle, and to fall heavily on the ground. Tell the children that such foolhardy feats do not tend to make them either brave or manly.

9. Page 44.—The heads of the boys only are made flat. It is probably done as a mark of the tribe.

10. Page 44.—Much care is taken to give soldiers this

form both for health and fine appearance. The stooped and rounded shoulders that fashion would at times impose upon women are ugly and unhealthful. Both boys and girls should be taught to admire the erect form and to try to gain it themselves. These lessons should be constantly applied in the school-room. Much may be done to correct the unhealthful position in which many children sit and stand.

11. Page 45.—Teachers can not do too much to arrest the reckless habits of using tobacco. Especially do boys need the teacher's help in this respect. Many boys are misled in supposing that tobacco will in some way aid in making them manly.

If they knew that its influence is only harmful, that it tends to arrest their growth and to make them weak and stunted, they would be less disposed to form the habit. The smoking of cigarettes is extremely harmful to the lungs and blood.

12. Page 48.—Use a piece of lean beef to show the structure and appearance of muscle.

13. Page 48.—Use sticks and strings with which to show how the muscles move the bones. (Fig. 1.) Feel the biceps muscle as it draws up the forearm, and learn that the muscle becomes shorter and broader in order



that it may move the bone. Move the fingers in opening and shutting the hand, and at the same time feel the muscles of the forearm that move the fingers. The tendons that join the muscles to the bones of the fingers may be felt at the wrist.

14. Page 52.—Children should not be left to learn what to avoid in their sports and exercises by the mistakes of experience. They may, through ignorance, exercise to such excess or in such a manner that they are harmed rather than benefited by what they do.

15. Page 58.—A blister separates the outer from the inner layer. We may cut or pierce the outer layer without pain or blood, because it has neither nerves nor blood-vessels.

16. Page 59.—Leather is made from the skins of animals. The human skin would make leather. Some kinds of undressed leather show the pores.

17. Page 63.—To cut the hair so close that the skin of the head is bare, is neither healthful nor beautiful, and it robs the head of the protection which the hair affords.

18. Page 72.—The pupils may see the blue veins on the back of the hand and front of the arm. The lips are red because we see the blood through the thin skin of the lips. The cheeks are rosy because we see the blood in the skin.

19. Page 73.—The wonderful work of the heart may be shown in figures. The heart throws at least two ounces of blood into the arteries at each beat. The force with which it throws this blood is its chief labor; but, to say nothing of this force and to take only the weight of the blood gives us the following figures as the day's work for the heart:

$$2 \text{ oz.} \times 80 = 160 \text{ oz.} = 10 \text{ lbs. per minute.}$$

$$10 \text{ lbs.} \times 60 = 600 \text{ lbs. per hour.}$$

$$600 \text{ lbs.} \times 24 = 14400 \text{ lbs.} = 7 \text{ tons per day.}$$

$$7 \text{ tons} = \text{weight of 100 men.}$$

20. Page 73.—Feel the pulse at the wrist and at the temple near the eye. The pulse is the blood bounding from the heart. The counting of the pulse tells how rapidly the heart beats.

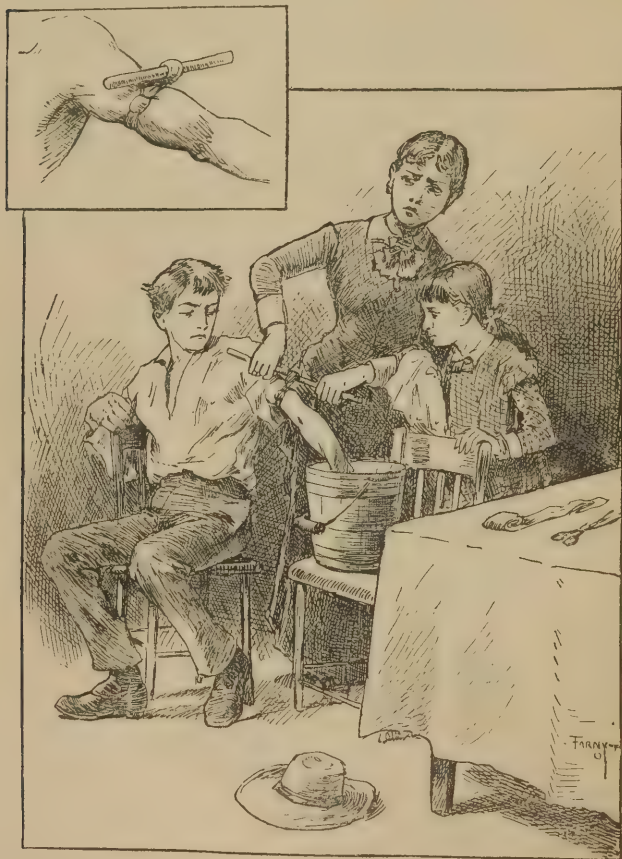


FIG. 2.

21. Page 76.—The vignette of Fig. 3 shows how the

cord is put around the arm to stop bleeding when the hand or fore-arm is badly cut. Observe that a knot is tied in the cord, handkerchief, or whatever is used, and that this knot is placed so as to press on the large blood-tube that leads from the heart in the arm. The cord is put above the elbow because there is but one bone between the shoulder and elbow.

In the case of a wound to the leg or the foot, the cord is put just above the knee, and the knot is arranged to press upon the back part of the leg. It is necessary to twist the cord with a stick to make the pressure so hard that the blood will stop.

22. Page 81.—Get the lungs and heart as they are cut from an animal by the butcher. Retain all the parts together. By using some kind of tube for a mouth-piece, and with it blowing into the wind-pipe, the lungs may be shown as they are when filled with breath. After using the lungs, cut out the heart and examine it.

23. Page 83.—Use a bottle and rubber tube with which to catch the breath as it comes from the lungs. To do this, fill the bottle with water and hold it mouth downward in a basin of water. Put one end of the tube in the mouth of the bottle and the other end in your mouth. Blow the breath from the lungs through the tube into the bottle. This will fill the bottle with breath.

By putting a cover over the mouth of the bottle before lifting it from the basin, the breath thus caught may not mix with the pure air outside. Put a lighted splinter of wood into the inclosed breath. The light will be put out at once because the breath is so impure.

24. Page 83.—Keep the school-room ventilated constantly and call the attention of the children to the need of keeping the windows open. When any one comes from the fresh air outside into a school-room he can easily smell the bad odor from the impure air unless the room is well ventilated.

25. Page 87. —Induce the butcher to save for you the brains and spinal cord from some animal. These are very interesting objects to children.

26. Page 93. —By putting a portion of the brain from some animal into weak alcohol we may observe how the alcohol in the blood will tend to harden the brain. This will prove an interesting experiment, and will serve to fasten the fact in the child's mind.

27. Page 96. —The teacher should pay much attention to the cultivation of the pupil's senses of seeing and hearing. Practice in judging size, direction, and distance, in rapid reading, in seeing the right shapes of letters, in drawing, in mapping, etc., tend to make the eyes quick and the mind accurate in its judgment.

Lessons on the color chart will test the child's ability to see different colors. Tests in reading from the black-board at different distances will test the child's length of vision. Many children are partially near-sighted. The teacher should learn the facts regarding the ability of the pupils to see.

The same is true of the culture and test of the sense of hearing. Practice in making sounds, in analysis of words into component sounds, in distinct pronunciation, in clearness and force of enunciation; cultivate the vocal apparatus and the ear together. Many pupils are heavy of hearing. Pupils are sometimes thought to be dull and inattentive because their sense of hearing is imperfect. One of the chief aims of primary teaching is to sharpen the senses of the children and endeavor to fix in them the habit of close attention.

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